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EXAMINER	
MARTINEZ, JOSEPH P	

ART UNIT	PAPER NUMBER
2873	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary	**Application No.**	**Applicant(s)**	
	10/596,735	MAHMOOD ET AL.	
	Examiner	**Art Unit**	
	JOSEPH MARTINEZ	2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10-1-07*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-11, 13-20, 22, 23 and 25-30 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Zeng et al. (US20020103439).

Re claim 1, Zeng et al. teaches for example in fig. 2, 4, 7 and 9, a beam splitter array (80) including: a first beam splitter (90) that outputs a first beam of optical radiation (reflected portion from 90) having a power spectral density that includes wavelengths over at least 50% of a white light spectrum that includes wavelengths between about 400 nanometers and about 670 nanometers (para. 0150; blue) from a first output port (fig. 4), and that outputs a second beam of optical radiation (transmitted portion through 90) having a power spectral density comprising a substantial portion of a first non-white light spectrum (para. 0150; red/NIR) and a substantial portion of a second non-white light spectrum (para. 0150; NIR) from a second output port (fig. 4), from an input beam received at a first angle of incidence (56); a second beam splitter (94), arranged to receive the second beam at a second angle of incidence (fig. 4 or 7), that reflects a substantial portion of the second beam

(reflected portion from 94) having a power spectral density comprising the first non-white light spectrum (para. 0150; red/NIR), and that transmits a substantial portion of the second beam (transmitted portion through 94) having a power spectral density comprising the second non-white light spectrum (NIR); and a reflector (95) arranged to reflect a substantial portion of the beam transmitted by the second beam splitter (fig. 4).

Re claim 13, Zeng et al. teaches for example in fig. 2, 4, 7 and 9, a beam splitter array (80) including: a first beam splitter (90) that outputs a first beam of optical radiation (reflected portion from 90) having a power spectral density comprising a substantial portion of a white light spectrum (para. 0150; blue) from a first output port (fig. 4), and that outputs a second beam of optical radiation (transmitted portion through 90) having a power spectral density comprising a substantial portion of a first non-white light spectrum (para. 0150; red/NIR) and a substantial portion of a second non-white light spectrum (para. 0150; NIR) from a second output port (fig. 4), from an input beam received at a first angle of incidence (56); a second beam splitter (94), arranged to receive the second beam at a second angle of incidence (fig. 4 or 7), that reflects a substantial portion of the second beam (reflected portion from 94) having a power spectral density comprising the first non-white light spectrum (para. 0150; red/NIR), and that transmits a substantial portion of the second beam (transmitted portion through 94) having a power spectral density comprising the second non-white light spectrum (NIR); and a reflector (95) arranged to reflect a substantial portion of

the beam transmitted by the second beam splitter (fig. 4); a first filter (106) that has a bandpass transmittance spectrum centered at about a center of the first non-white light spectrum (para. 0150) arranged to receive a beam of optical radiation reflected from the second beam splitter at the second angle of incidence (fig. 4); a second filter (108) that has a bandpass transmittance spectrum centered at about a center of the second-non white light spectrum (para. 0150) arranged to receive a beam of optical radiation reflected from the reflector (fig. 4); a first waveguide (67) arranged to deliver optical radiation radiated from a sample (63) to the first beam splitter (90) at the first angle of incidence; a first detector (86) arranged to receive a beam of optical radiation output from the first beam splitter at the first angle of incidence (fig. 4); and a second detector (88; para. 0084) arranged to receive a beam of optical radiation reflected from the second beam splitter (94) and a beam of optical radiation reflected from the reflector (95).

Re claim 22, Zeng et al. teaches for example in fig. 2, 4, 7 and 9, a method comprising: illuminating a sample (63) with optical radiation from a source of optical radiation (180) that includes white light (146); collecting optical radiation (58) from the sample (fig. 2); delivering the collected optical radiation to a beam splitter array (80); detecting a first image of optical radiation (via 86) with a power spectral density that includes a white light spectrum (para. 0150; blue) from the beam splitter array (90); detecting a second image of optical radiation (via 88) with a power spectral density that includes a first non-white light spectrum (para. 0150; red/NIR) from the beam

splitter array (94); and detecting a third image of optical radiation (via 89) with a power spectral density that includes a second non-white light spectrum (para. 0150; NIR) from the beam splitter array (94).

Re claims 3 and 25, Zeng et al. further teaches for example in fig. 4, the first output port comprises a surface of the first beam splitter (90) from which light is reflected (reflected portion from 90), and the second output port comprises a surface of the first beam splitter through which light is transmitted (transmitted portion through 90).

Re claim 4, Zeng et al. further teaches for example in fig. 4 and 7, the second beam splitter (94) is further arranged to reflect the first beam in a first direction, and the reflector is further arranged to reflect the second beam in a second direction that is within 20* of the first direction (fig. 7; wherein the examiner interprets the pentagon shaped prism system to teach the claimed limitation).

Re claim 5, Zeng et al. further teaches for example in fig. 4 and 6, the first beam splitter (90) has an optical transmittance spectrum that is larger than 0.5 over at least 50% of the white light spectrum that includes wavelengths between about 400 nanometers and about 670 nanometers (fig. 6; para. 0150), and an optical reflectance spectrum that is larger than 0.5 over the first non-white light spectrum that does not overlap the white light spectrum (fig. 6; para. 0150) and is larger than 0.5 over the

second non-white light spectrum that does not overlap the white light spectrum or the first non-white light spectrum (fig. 6).

Re claim 6, Zeng et al. further teaches for example in fig. 4 and 6, the second beam splitter (94) has an optical reflectance spectrum that is larger than 0.5 over the first non-white light spectrum (fig. 6; para. 0150), and an optical transmittance spectrum that is larger than 0.5 over the second non-white light spectrum (fig. 6; para. 0150).

Re claim 7, Zeng et al. further teaches for example in fig. 4 and 6, the reflector has an optical reflectance spectrum that is larger than 0.5 over the second non-white light spectrum (fig. 6; para. 0150).

Re claim 8, Zeng et al. further teaches for example, the first non-white light spectrum comprises a near-infrared spectrum (para. 0150).

Re claim 9, Zeng et al. further teaches for example, the first non-white light spectrum comprises a narrowband visible spectrum (para. 0150).

Re claim 10, Zeng et al. further teaches for example, the first non-white light spectrum includes wavelengths between about 680 nanometers and about 720 nanometers (para. 0150).

Re claim 11, Zeng et al. further teaches for example, the second non-white light spectrum includes wavelengths between about 760 nanometers and about 800 nanometers (para. 0150).

Re claim 14, Zeng et al. further teaches for example in fig. 2, 4, 7 and 9, the first detector comprises a camera (para. 0084).

Re claim 15, Zeng et al. further teaches for example in fig. 2, 4, 7 and 9, the second detector (88) comprises a single camera arranged to receive the beam of optical radiation reflected from the second beam splitter (94) and the beam of optical radiation reflected from the reflector (para. 0084).

Re claim 16, Zeng et al. further teaches for example in fig. 2, 4, 7 and 9, the second detector (88, 89) comprises two cameras arranged to receive the beam of optical radiation reflected from the second beam splitter (94) and the beam of optical radiation reflected from the reflector (para. 0084).

Re claim 17, Zeng et al. further teaches for example in fig. 2, 4, 7 and 9, a source of optical radiation that includes white light (180); and a second waveguide (55) arranged to deliver the optical radiation produced by the source to the biological tissue (63).

Re claim 18, Zeng et al. further teaches for example in fig. 2, 4, 7 and 9, the source is filtered to reduce white light in the first non-white light spectrum and the second non-white light spectrum (via 184).

Re claim 19, Zeng et al. further teaches for example in fig. 2, 4, 7 and 9, the source comprises a broadband white light source (146) combined with a narrowband non-white light source (144).

Re claim 20, Zeng et al. further teaches for example in fig. 2, 4, 7 and 9, the broadband white light source comprises a xenon lamp (para. 0205).

Re claim 23, Zeng et al. further teaches for example in fig. 2, 4, 7 and 9, the beam splitter (80) array comprises: a first beam splitter (90) that outputs a first beam of optical radiation (reflected portion from 90) having a power spectral density comprising a substantial portion of a white light spectrum (para. 0150; blue) from a first output port (fig. 4), and that outputs a second beam of optical radiation (transmitted portion through 90) having a power spectral density comprising a substantial portion of a first non-white light spectrum (para. 0150; red/NIR) and a substantial portion of a second non-white light spectrum (para. 0150; NIR)from a second output port (fig. 4), from an input beam (56) received at a first angle of incidence; a second beam splitter (94), arranged to receive the second beam at a

second angle of incidence (fig. 4), that reflects a substantial portion of the second beam (reflected portion from 94) having a power spectral density comprising the first non-white light spectrum (para. 0150; red/NIR), and that transmits a substantial portion of the second beam (transmitted portion through 94) having a power spectral density comprising the second non-white light spectrum (para. 0150; NIR); and a reflector (95) arranged to reflect a substantial portion of the beam transmitted by the second beam splitter (fig. 4).

Re claim 26, Zeng et al. further teaches for example in fig. 2, 4, 7 and 9, the first, second, and third images are detected simultaneously (fig. 4).

Re claim 27, Zeng et al. further teaches for example in fig. 2, 4, 7 and 9, the first, second, and third images are recorded (via 47).

Re claim 28, Zeng et al. further teaches for example in fig. 2, 4, 7 and 9, combining two or more of the first, second, and third images using a mathematical function (para. 0077 and 0081).

Re claim 29, Zeng et al. further teaches for example in fig. 2, 4, 7 and 9, the beam of optical radiation reflected from the second beam splitter and the beam of optical radiation reflected from the reflector are far enough apart on the camera for the images not to overlap (fig. 4).

Re claim 30, Zeng et al. further teaches for example in fig. 2, 4, 7 and 9, the second image and the third image are far enough apart on the surface for the images not to overlap (fig. 4).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2, 12, 21 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zeng et al. (US20020103439).

Re claims 2 and 24, supra claim 1. Furthermore, Zeng et al. further teaches for example in fig. 2, 4, 7 and 9, the first output port comprises a surface of the first beam splitter and the second output port comprises a surface of the first beam splitter.

But, Zeng et al. fails to explicitly teach the first output port through which light is transmitted and the second output port through which light is reflected.

However, Zeng et al. teaches for example in fig. 7, rearranging the beam splitter output ports (prism system). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to rearrange the output

ports of the beam splitters, since it has been held that rearranging parts of an invention involves only routine skill in the art.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Zeng et al. with the rearranged output ports of the first beam splitter in order to provide a compact space in which to redirect the light, as taught by Zeng et al. in fig. 7.

Re claim 12, supra claim 1. Furthermore, Zeng et al. further teaches for example in fig. 2, 4, 7 and 9, a first filter (106) that has a bandpass transmittance spectrum centered at about 700 nm to receive the first beam (para. 0153); and a second filter (108) that has a second bandpass transmittance spectrum arranged to receive the second beam.

But, Zeng et al. fails to explicitly teach a second bandpass transmittance spectrum centered at about 780 nm.

However, Zeng et al. teaches for example, varying the filter (para. 0155). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a second bandpass transmittance spectrum centered at about 780 nm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Zeng et al. with a second

bandpass transmittance spectrum centered at about 780 nm in order to provide enhanced color separation, as taught by Zeng et al. (para. 0155).

Re claim 21, supra claim 19.

But, Zeng et al. fails to explicitly teach the narrowband non-white light source comprises a laser diode.

However, Zeng et al. teaches for example, varying the light source (para. 0205). Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a laser diode, since laser diodes and narrowband non-white light sources are known equivalents in the art and the selection of any of these known equivalents would be within the level of ordinary skill in the art.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Zeng et al. with a laser diode in order to accommodate be able to provide all necessary illumination for both reflectance and fluorescence imaging, as taught by Zeng et al. (para. 0205).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph P. Martinez whose telephone number is 571-272-2335. The examiner can normally be reached on M-F 7:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on 571-272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Joseph Martinez/
Primary Examiner
AU 2873
9-27-10